linear relationships among the parameters. This procedure was applied to the data as a whole, by stratigraphic position, by major lithologic group, and regionally by tributary and river segment.

Contour Mapping of Data

Contour maps were assembled to provide a graphical illustration of the spatial distribution of metal concentrations in the sediment samples. Data for the maps was processed using the following procedure. Results of chemical analyses (reported in ug/g or ppm) were merged with the location data for each site. Samples representing the surface sediments at each site (from the surface to -10 cm) were sorted for the data set and a trimmed mean concentration for each element was calculated. The trimmed mean was obtained by eliminating all samples with concentrations greater than 2 standard deviations from the mean. This technique provides realistic background mean concentrations for each element that represents modern sedimentation concentrations within the Pamlico estuarine system; it specifically excludes extreme values resulting from anthropogenic inputs and the influence of relict sediments.

Elemental concentrations for each individual sample within the study area were then ratioed to the trimmed means to yield enrichment factor ratios that are either positive or negative with respect to the trimmed mean. Enrichment factor is often used differently in the geochemical literature. For example, Zoller et al. (1974) and Bruland et al. (1974) develop enrichment factors by ratioing the element to either Fe or Al within the analyzed air, water, or sediment and to some reference material such as crustal abundance. In this procedure, Fe or Al are used as normalizing factors because anthropogenic sources are generally considered to be negligible; therefore, the primary source would be from crustal weathering. The advantage of utilizing this definition is that it minimizes variations due to grain size of the sediments. Harding (1974), in a trace metal study of the middle Pamlico River area, normalized their elemental data to the concentration of clay plus organic matter. This resulted in an enrichment inversion whereby the highest anomalies occurred in the shallow waters dominated by quartz sand sediments. The small amount of mud that occurs within these quartz sand environments may be richer in metals; however, there is so little mud that it becomes insignificant with respect to the metal concentration in the total sediment.

An evaluation of the correlation coefficients in the present study demonstrated a generally strong correlation of metal concentration to the percent of fine-grained sediment fraction relative to sand within the Pamlico River system. However, generally most metals lacked a significant correlation between metal concentration and organic matter or clay content. Table 13 shows the wide variation of both organic matter and clay constituents within the most and least polluted portions of the system.

Application of general correction factors based upon metal/iron and metal/aluminum ratios, similar to Zoller et al. (1974) and Bruland et al. (1974), is not appropriate for this study. Such enrichment factors are utilized with results obtained by total digestion techniques; however, this study utilized a partial extraction procedure and it is not known how reproducable the percent extraction for each metal is for different sample